

What is claimed is:

1. A pattern inspection method comprising the steps of:

attaining a digital image of an object substrate through microscopic observation thereof;

detecting defects in examination of the attained digital image while masking a pre-registered region or a pattern meeting a pre-registered pattern; and

outputting an image of each of the defects thus detected together with position-on-substrate data thereof.

2. A pattern inspection method as claimed in claim 1,

wherein the pre-registered region or pre-registered pattern is a region or pattern which has been set up using the digital image attained through microscopic observation of the object substrate.

3. A pattern inspection method as claimed in claim 1,

wherein data regarding the masked region is also output.

4. A pattern inspection method comprising the steps of:

attaining a digital image of an object substrate through microscopic observation thereof;

detecting defects in examination of the attained digital image;

and

displaying data regarding each of the defects thus detected on a display screen;

wherein, at the data displaying step, defects are indicated on the display screen excluding defects having a feature that meets a pre-registered feature, or defects having a feature that meets a pre-registered feature are so indicated as to be distinguishable from the other detected defects.

5. A pattern inspection method as claimed in claim 4,  
wherein the pre-registered feature is a feature which has been set up using the digital image attained through microscopic observation of the object substrate.

6. A pattern inspection method as claimed in claim 4,  
wherein an image of each of the detected defects is also displayed on the display screen.

7. A pattern inspection method comprising the steps of:  
attaining a digital image of an object substrate through microscopic observation thereof;  
detecting defects in examination of the attained digital image;  
and  
outputting data regarding each of the defects thus detected;  
wherein, at the data outputting step, data regarding defects

located in a pre-registered region, data regarding defects having a pattern that meets a pre-registered configuration, or data regarding defects having a pattern that meets pre-registered feature quantity data is so output as to be distinguishable from data regarding the other detected defects.

8. A pattern inspection method as claimed in claim 7,  
wherein at least one of the pre-registered region, pre-registered configuration and pre-registered feature quantity data is a fact or which has been set up using the digital image attained through microscopic observation of the object substrate.

9. A pattern inspection method as claimed in claim 7,  
wherein position-on-substrate data of each of the other detected defects is displayed on a display screen together with an image of each of the other detected defects.

10. A pattern inspection method as claimed in claim 7,  
wherein feature quantity data of each defect contains at least one kind of data including defect position data, projection length data, area data, and shape data.

11. A pattern inspection method comprising the steps of:  
attaining a digital image of an object substrate through

microscopic observation thereof;

detecting candidate defects by processing the attained digital image;

extracting defects from the detected candidate defects by excluding candidate defects located in a predefined region on the object substrate or by excluding candidate defects having a pattern that meets a pre-registered pattern;

displaying an image of each of the extracted defects on a display screen together with position-on-substrate data and feature quantity data thereof;

classifying the extracted defects through examination of the displayed image of each of the extracted defects; and

outputting class data of each of the classified defects together with feature quantity data thereof.

12. A pattern inspection method as claimed in claim 11,  
wherein the class data of each of the classified defects is displayed on the display screen together with an image thereof.

13. A pattern inspection method as claimed in claim 11,  
wherein a digital image of each of the detected candidate defects is stored, and a judgment for extracting defects from the detected candidate defects is made using the stored digital image of each of the detected candidate defects.

14. A pattern inspection method as claimed in claim 11,  
wherein the feature quantity data of each of the extracted defects  
is displayed on a CAD terminal.

15. A pattern inspection method as claimed in claim 11,  
wherein the feature quantity data of each of the extracted defects  
is displayed or printed together with CAD data thereof.

16. A pattern inspection apparatus comprising:  
an image detecting part for detecting a digital image of an object  
substrate;  
a memory part for storing coordinate data, pattern data or feature  
quantity data of a non-inspection region to be masked on the object  
substrate; and  
a defect judging part in which the digital image detected by the  
image detecting part is examined in a state that a region meeting a  
condition stored in the memory part is masked.

17. A pattern inspection apparatus comprising:  
image detecting means for attaining a digital image of an object  
substrate through microscopic observation thereof;  
defect detecting means for detecting defects in examination of  
the digital image attained by the image detecting means while masking

a pre-registered region or a pattern meeting a pre-registered pattern;  
and

output means for outputting data regarding the defects detected  
by the defect detecting means.

18. A pattern inspection apparatus as claimed in claim 17,  
wherein the pre-registered region or pre-registered pattern is  
set up using the digital image attained by the image detecting means  
through microscopic observation of the object substrate.

19. A pattern inspection apparatus as claimed in claim 17,  
wherein the output means displays an image of each of the detected  
defects and position-on-substrate data thereof.

20. A pattern inspection apparatus comprising:  
image pickup means for attaining a digital image of an object  
substrate through microscopic observation thereof;  
candidate defect detecting means for detecting candidate defects  
in examination of the digital image attained by the image pickup means;  
and  
defect extracting means for extracting defects from the candidate  
defects detected by the candidate defect detecting means and for  
displaying data of each of the extracted defects on a display screen;  
wherein the defect extracting means indicates defects on the

display screen excluding defects having a feature that meets a feature pre-registered in the defect extracting means, or the defect extracting means indicates defects having a feature that meets a feature pre-registered in the defect extracting means so that the defects having a feature that meets the pre-registered feature can be distinguished from the other detected defects.

21. A pattern inspection apparatus as claimed in claim 20, wherein the feature pre-registered in the defect extracting means is a feature which has been set up using the digital image attained through microscopic observation of the object substrate.

22. A pattern inspection apparatus as claimed in claim 20, wherein the defect extracting means displays an image of each defect and position-on-substrate data thereof on the display screen.

23. A pattern inspection apparatus comprising:  
image pickup means for attaining a digital image of an object substrate through microscopic observation thereof;  
candidate defect detecting means for detecting candidate defects in examination of the digital image attained by the image pickup means;  
and  
defect extracting means for extracting defects from the candidate defects detected by the candidate defect detecting means and for

displaying data of each of the extracted defects on a display screen; wherein the defect extracting means outputs position-on-substrate data and image data of candidate defects excluding data regarding candidate defects located in a pre-registered region, data regarding candidate defects having a pattern that meets a pre-registered configuration, or data regarding candidate defects having a pattern that meets pre-registered feature quantity data; or the defect extracting means outputs position-on-substrate data and image data of candidate defects in a distinguishable form without excluding data regarding candidate defects located in the pre-registered region, data regarding candidate defects having a pattern that meets the pre-registered configuration or data regarding candidate defects having a pattern that meets the pre-registered feature quantity data.

24. A pattern inspection apparatus as claimed in claim 23, wherein at least one of the pre-registered region, pre-registered configuration and pre-registered feature quantity data is a fact or which has been set up using the digital image attained through microscopic observation of the object substrate.

25. A pattern inspection apparatus as claimed in claim 23, wherein feature quantity data of each defect contains at least one kind of data including defect position data, projection length data, area data, and shape data.

26. A pattern inspection apparatus comprising:

image pickup means for attaining a digital image of an object substrate through microscopic observation thereof;

candidate defect detecting means for detecting candidate defects in examination of the digital image attained by the image pickup means;

defect extracting means for extracting defects from the candidate defects detected by the candidate defect detecting means by excluding candidate defects located in a predefined region on the object substrate or by excluding candidate defects having a pattern that meets a pre-registered pattern;

display means for displaying an image of each of the defects extracted by the defect extracting means on a display screen together with position-on-substrate data and feature quantity data thereof;

defect classifying means for classifying the extracted defects through examination of the displayed image of each of the extracted defects; and

output means for outputting class data of each of the defects classified by the defect classifying means together with feature quantity data thereof.

27. A pattern inspection apparatus as claimed in claim 23, wherein the display means displays the class data of each of the classified defects on the display screen together with an image thereof.

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